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## Nation's largest rocket test stand ready for blast off

by **Ranney Adams, Propulsion Directorate**

**EDWARDS AIR FORCE BASE, Calif.** — The only Defense Department stand capable of performing full-scale rocket chamber development testing in the 750,000-pound thrust class was recently modernized and is ready for action.

Test Stand 2-A, one of the nation's largest rocket test stands, is primarily used for development testing advanced rocket engine turbomachinery and combustion components, but it can be used for numerous high-pressure and flow-rate propulsion systems again. It was used more than 30 years ago for Apollo Moon-mission F-1 rocket engine production testing.

Located at the Air Force Research Laboratory's Edwards Research Site, Test Stand 2-A is part of nearly \$3 billion worth of facilities that have provided the nation with rocket propulsion research, development and test capabilities for more than 50 years.

Aerospace leaders from Boeing-Rocketdyne, Pratt and Whitney and Aerojet and numerous other industry and government officials attended the test stand's ribbon-cutting ceremony and made comments during the event.

Col. Mike Heil, AFRL's propulsion directorate director said, "Today is a watershed day in aerospace, a day when our national space policy is being laid out for the world."

Maj. Gen. Paul Nielsen, AFRL commander, participated in the ribbon-cutting ceremony with other Air Force officials.

"The lab's vision statement," he said, "states that 'We defend America by unleashing the power of innovative science and technology.' We believe this vision is shared by our colleagues in industry and academia who help us advance science and technology for our country. There is probably no technology we work on that exhibits that power as much as rocket propulsion power, space launch power and these facilities are in the heart of that envelope."

"I attended a ceremony here in November 2000," the general continued, "a dedication of the rocket site as a historic site by the American Institute of Aeronautics and Astronautics. It commemorated the strong foundation created here over the years by the hard work and innovation of the men and women of this facility. I love to respect the past, but even more, I like to create the future. This facility is where we create the future, where we build for the 21st century."

General Nielsen also discussed the teamwork involved with the test stand.

"Nothing like this gets done without a lot of people working together," he said. "People have commented about how well our government and industry team has worked to bring this to pass, how strongly the executive department and legislative depart-



*Test Stand 2-A fires an Apollo-era F-1 engine thrust chamber during the 1960s. The test stand was recently modernized with an \$18.5 million, 18-month refurbishment. (Air Force photo)*

ment of the federal government have worked to bring this to pass, how united federal, state and local officials have been.

"This really can serve as an example for all people across the United States on how to bring people together to do something extremely important for the future of our country, the future of our children and the future of our grandchildren."

The first 40 years of launch vehicle and spacecraft development has been described as the first space age.

"We have done the initial exploration," said General Nielsen. "Now as we go into the 21st century, we are getting involved in the second space age, where our use of space will grow so much. I'd like to think of this facility, this great investment that people have made, as a facility that is really crucial and key to the United States development of the second space age."

General Nielsen directs the Air Force's \$1.7 billion science and technology budget in addition to \$1.3 billion from laboratory customers. That investment in technology research and development is conducted by the lab's 8,700 military and civilian experts at research sites across the nation.

According to Robert Drake, AFRL propulsion directorate's chief operations planner, one of the functions of DoD laboratories is to provide special-purpose facilities that are not practical for the private sector to own or operate.

"AFRL has traditionally supported the development and installation of a full-scale liquid rocket component develop-

**continued on page 2**

***continued from page 1***

ment test capability needed for development of new rocket engine technologies,” he said.

Originally designed and built in the early 1960s for Apollo’s F-1 rocket engine component development and testing, the test stand has been modernized to current day standards with an \$18.5 million, 18-month refurbishment effort. Officials said these modernization costs are small compared to the five-year lead time and estimated \$500 million in construction costs for a brand new test stand.

Testing next-generation rocket engine components on Test Stand 2-A is intended to provide more reliable, lower-cost and higher performance rocket engines for tomorrow and adds to AFRL’s assets of unique facilities that provide the nation with the most modern and complete research, development and test capabilities for rocket propulsion technology progress, officials said.

Nearly every American rocket propelled satellite, missile or launch vehicle has been touched by the technology research, development or testing conducted at the Edwards Research Site. @